investigators at Le Bonheur Children’s and Campbell Clinic are working to develop new options for evaluating and treating children with orthopaedic disorders and injuries. Some of the highlights of the program include:

**Study: Genetic AIS test for African Americans**

Researchers are leading studies to develop a genetic test that can predict progression of adolescent idiopathic scoliosis in African Americans.

Le Bonheur serves as a leading center for the project, sponsored by Axial Biotech, which began this summer. In the first phase of the study, researchers will study the spinal curvature progression of African-American adolescents who have completed treatment for scoliosis. The study will analyze the genetic profile of those adolescents, comparing it to their progression, to better understand correlations in the profiles. All variances of spinal curvatures will be studied.

In the second phase of research, investigators will gather DNA profiles of new African-American patients and follow their curvature until maturity.

**Genetic testing helps predict curvature outcomes**

Surgeons at Campbell Clinic and Le Bonheur are now using SCOLISCORE to help predict progression in Caucasian patients. A good candidate for the test is a 9- to 13-year-old girl with a mild curve up to 30 degrees who has never been diagnosed with adolescent idiopathic scoliosis (AIS), said Jeffrey R. Sawyer, MD. “With moderate progression, I can use the SCOLISCORE test in these cases to predict curvature. If the score is high, I will recommend we brace early to prevent deformity,” Sawyer said.

On the other hand, an older child with a low AIS (under 20 degrees) may not need bracing, as the test tells Sawyer the curve is unlikely to progress more. It also enables us to cut down on X-rays, because we have a good predictor on how fast the curvature will progress,” Sawyer said.

**Case study:**

**Ashlie Bradford, spinal tumor**

For nearly a year and a half, 12-year-old Ashlie Bradford slowly lost strength in her legs until she couldn't walk. The avid bicycle rider who loved the outdoors couldn’t stay on her bike anymore. The Bradfords, from Muscle Shoals, Ala., would see nine doctors before a Huntsville neurologist found a spinal column tumor involving T8 and T9 levels with severe compression of the spinal cord. Stability of her spine was compromised and she had a kyphotic deformity. Ashlie was referred to Pediatric Neurosurgeon Paul Klimo of Semmes Murphey Neurosurgery, who worked with fellow Neurosurgeon Michael Multibauer, MD, and Campbell Clinic Orthopaedic Surgeon William Warner, Jr., MD, to resect the tumor and decompress the spinal cord. Warner then stabilized her spine with rods/screws and bone from her hip. Surgeons were able to use O-arm surgical imaging technology to provide real-time, intraoperative CT imaging.

O-arm technology provides both 2D fluoro and 3D multi-planar reconstructed orthopaedic images of bone anatomy. The system can also integrate with Medtronic's StealthStation surgical navigation systems to confirm the precision hardware therapy placement in advanced surgical procedures. “Ashlie had very narrow bony channels where the screws would be placed. The O-arm allowed us to place the screws very accurately and thus safely,” Klimo said.

Added Warner: "Using the surgical navigation allowed us to safely place pedicle screws in a very narrow pedicle. Without the surgical navigation it would have been very difficult to safely place these pedicle screws and we would not have been able to obtain as secure fixation to stabilize Ashlie's spine.”

The O-arm also allowed surgeons to see how well they removed the tumor, which involved bone in her vertebra.

Klimo and Warner were able to leave the operating room knowing the hardware was safely in place and the tumor appeared to be completely removed around the spinal cord and from the vertebral body.

"One month after surgery, Ashlie is now ambulating independently with a cane and we expect her to make a full recovery,” Warner said. “We were also able to obtain 50 percent correction of her kyphotic deformity (round back) that was the result of vertebral body destruction from the tumor.”
"Common Conditions and Injuries of the Lower Extremity in Children and Adolescents," will feature Le Bonheur and Campbell Clinic pediatric orthopaedic surgeons.

The symposium will feature guest speaker Steven Frick, MD, a pediatric orthopaedic surgeon at the Levine Children’s Hospital and residency program director for the Department of Surgery at the Carolinas Medical Center in Charlotte, NC. Frick is the current chair of the Leadership Development Committee of both the American Academy of Orthopaedic Surgeons and the American Orthopaedic Association.

Conference topics will address common conditions and injuries of the foot and ankle, and hip. Specific topics include:

**Pain in the foot: what to do? Osteochondroses of the foot**
William C. Warner, Jr., MD

**Clubfoot: Ponseti casting, French method, surgical correction? How to choose the best treatment option**
Steven L. Frick, MD

**Newborn flatfeet: what to treat and what to refer**
Derek M. Kelly, MD

**Other disorders of the pediatric foot: hallux valgus, polydactyly, metatarsus adductus, other congenital deformities**
Jeffrey R. Sawyer, MD

**Sports injuries of the foot and ankle**
James H. Beaty, MD

**Office orthopaedics: what to do for the child with a foot problem?**
Leslie Rhodes, RN

**Developmental dysplasia of the hip**
Steven L. Frick, MD

**Legg-Calvé-Perthes disease: diagnosis and treatment**
James H. Beaty, MD

**Slipped capital femoral epiphysis**
Jeffrey R. Sawyer, MD

**Hip preservation in the adolescent: surgical dislocation and Ganz osteotomy**
Derek M. Kelly, MD

**Hip arthroscopy in children and adolescents**
Marc J. Mihalko, MD

**The “snapping” hip: diagnosis and treatment**
William C. Warner, MD

For more information about the conference, visit www.methodistmd.org.

Authors followed eight patients for 24 months who suffered from severe lower extremity trauma. Kickstands were applied in less than 15 minutes at the conclusion of surgical procedures where external fixator frames were assembled after pins were placed in the appropriate locations based on the fracture configuration and soft-tissue injuries. The kickstand ensured elevation, eliminated the need for splint or cast change, was lightweight and adjustable, and provided for circumferential access in wound care and neuromuscular exams. Investigators found all patients tolerated the device and none suffered from pressure sores or complications related to the device.

**Study: Lateral radiographs justified in Sever disease**

Researchers evaluating the necessity of radiographic evaluation in children with calcaneal apophysitis, known also as Sever disease, found that routine lateral radiographs are justified. Published in the Journal of Pediatric Orthopaedics, “Is Radiographic Evaluation Necessary in Children With a Clinical Diagnosis of Calcaneal Apophysitis (Sever Disease),” 2011; 31:548-550, the study reviewed clinical records and radiographs of 98 patients whose chief complaint was heel pain. Findings suggested that despite concern about radiation exposure and cost of imaging, radiographs should be obtained to rule out abnormalities, such as lesions, that could require more aggressive treatment.

**Research fellow, coordinator join team**

Le Bonheur and Campbell Clinic have added a new OREF research fellow and clinical research coordinator to assist with more research.

**New orthopaedic research fellow**

Nelson Astur will begin his pediatric spine research fellowship at Le Bonheur and Campbell Clinic, in a program funded by the Orthopaedic Research and Educational Foundation. Astur completed a spine fellowship and orthopaedic residency at Santa Casa School of Medicine in Sao Paulo, Brazil. Astur will help oversee multiple scoliosis studies at Le Bonheur and Campbell Clinic.

**Alice Ruch joins Campbell Clinic**

Alice Ruch is an orthopaedic clinical research coordinator. Ruch assists with all aspects of orthopaedic research, including Institutional Review Board (IRB) submission of prospective and retrospective studies, subject enrollment and tracking, data retrieval, documentation, etc. She is currently assisting with studies in VEPTR, clubfoot and scoliosis.

Ruch has a bachelor of nursing degree from Baptist College of Health Sciences and is a member of Sigma Theta Tau International Nursing Honor Society. She most recently served at InMotion Orthopaedic Research Center.

**NURSE PRACTITIONERS PRESENT RESEARCH, EXPERTISE**

Nurse practitioners with Le Bonheur Children’s Hospital are sharing their research about fractures and slipped capital femoral epiphysis with other clinicians.


Rhodes and Donna C. Scott, PNP-BC, presented at the 13th Annual Pre-Brandon Carrell Pediatric Orthopaedic Symposium at Texas Scottish Rite Hospital for Children. Scott presented “Pediatric Fracture Clinics: Current Status and Future Directions,” which highlighted the essential components for a high-volume, multidisciplinary fracture clinic.

Rhodes presented “Current Management of slipped capital femoral epiphysis,” a common childhood disorder of the hip. SCFE is often misdiagnosed because of initial presentation of knee pain and limping. She discussed the diagnosis, classification and treatment options.

Rhodes also facilitated a round table discussion on pediatric sports medicine at the 2011 Pediatric Orthopaedic Practitioner’s Society Annual Conference held in conjunction with the Pediatric Orthopaedic Society of North America’s annual conference.
**Case study: China Jones, slipped capital femoral epiphysis**

China Jones' hip used to freeze up if she sat on the floor for longer than 15 minutes. Walking for 10 minutes would cause so much pain the 11-year-old would cry. For two years, China was homebound and missed going to school on a daily basis. Her mother, Lisa, says China struggled with anger and depression.

China's pain was caused by residual deformity after slipped capital femoral epiphysis (SCFE). SCFE commonly affects children between the ages of 10-14. Untreated, it can lead to severe pain, deformity, and osteoarthritis possibly requiring a hip replacement.

Surgeons at Le Bonheur Children's and Campbell Clinic tried several noninvasive treatments and four surgeries to relieve pain and prevent the femur from slipping. The next step was an intertrochanteric femoral osteotomy, which posed some challenges to the surgical team. Because China had a screw in her hip already, the orthopaedic team couldn't get an MRI to determine if China had a labral tear, which Orthopaedic Surgeon Derek Kelly, MD suspected.

To eliminate the need for two surgeries, Kelly partnered with Campbell Clinic Orthopaedic Surgeon Marc Mihalko, MD, who specializes in hip arthroscopy. Under one anesthetic, Mihalko was able to diagnose and repair the torn labrum. Kelly then performed an intertrochanteric femoral osteotomy to realign the deformity. By performing the procedures together, Campbell Clinic surgeons hope they have eliminated China's pain and prevented her from developing arthritis which could require a hip replacement down the road.

At her two-week follow-up visit, China grinning from ear to ear announced she was pain-free. When China will no longer need to use a wheelchair or walker, her family plans to take a trip to Hot Springs.

"Dr. Kelly is always willing to take the extra time to attend to whatever questions or concerns we have," Lisa said. "He gave us a heads up on everything and we take a trip to Hot Springs.

Multiple trauma with fractures of the radius and ulna, the proximal tibial growth plate and the shafts of the tibia and fibula.

**Case study: William “Drews” Andrews, trauma**

During a trip to his family's Mississippi farm, 12-year-old William “Drews” Andrews was riding in the woods with friends when the dirt bike he was driving collided head-on with an all-terrain vehicle (ATV). A helmet might have saved Drews' life, but it didn't save him from serious injury.

"When we got to him, we could tell his left arm was mangled," said mom, Maureen Andrews. "We couldn't see how badly his leg was hurt because he was wearing jeans.

Drew's parents rushed him to the nearest emergency room in Oxford, Miss. Knowing immediate surgery was necessary, doctors transferred him to Le Bonheur Children's Hospital via helicopter.

Once at Le Bonheur, X-rays revealed a badly broken left tibia and fibula, a fractured left proximal tibial physis and a broken left radius and ulna.

According to Campbell Clinic Pediatric Orthopaedic Surgeon James Beaty, MD, Drews underwent surgery to repair a growth plate injury of the upper tibia, rodding of the forearm fractures and casting of the tibial and fibular shaft fractures.

"Drews had such a positive attitude and a great support network of family and friends," said Beaty.

Drew spent four months going through rehabilitation while his fractures healed. Beaty continued to monitor his recovery, and Drews received ongoing physical therapy.

"The level of care we got from the very beginning at Le Bonheur helped us see the positive and know Drews would be OK," said mom, Maureen.

Drews underwent four surgeries in all. The final one was leg-length equalization because of the severe injury to the upper tibia.

Because of the growth plate injury, it was uncertain whether Drews — from a family of tall men — would grow to reach his full height potential. Now 15 and an upcoming high school freshman, Drews is already 6 feet tall. He has no physical limitations from the accident and is a star basketball player.

"His outcome is truly a testimony to the care provided at Le Bonheur and to God," said Maureen.

**Le Bonheur Orthopaedics joins U.S. News “best hospital” ranks**

The orthopaedic program at Le Bonheur Children's was named in 2011 as one of the country's best by U.S. News & World Report.

Le Bonheur also earned designations in cardiology and heart surgery, neurology and neurosurgery and nephrology.

"The children we care for count on us to be the best. We have taken that responsibility very seriously and are thrilled to be recognized by the experts at U.S. News & World Report," said Le Bonheur President and CEO Meri Armour. "We will continue to provide excellent care for children for years to come."

Establishing Le Bonheur among the nation's top children's hospital has been a vision since 2005, and Le Bonheur has used the survey as a benchmarking tool since 2007. Le Bonheur has focused on creating multi-disciplinary programs, implementing quality improvement initiatives and investing in technology.
Research, Publications and Presentations

Le Bonheur Children's Hospital and Campbell Clinic Chick are a group of orthopedic surgeons actively involved in clinical care and education. They are dedicated to the advancement of knowledge and practice of pediatric orthopedics. Highlights from their work and presentations:

Presentations


